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The Influence of Thinking Actively in a Social Context Learning Model on Divergent Thinking Skills (Thinking Actively in a Social Context Learning Model on Divergent Thinking Ability)

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Abstract: This research goal to identify the application of Thinking Actively in a Social Context learning model on divergent thinking skills in fifth-grade elementary school students. The type of quantitative research with a quasi-experimental type was adopted as the research approach. The research participants totaled 180 fifth-grade elementary school students. The research area was in Laweyan District, Surakarta. Six elementary schools participated in this study. Essay test was used as the instrument to collect data. For data analysis, prerequisite tests, normality test (Lilliefors), and homogeneity test (Bartlett test) were performed. Hypothesis testing was done by t-test. The research findings showed data that t was greater than t-table ($9.07 > 1.97$), so H_0 is rejected. This means that Thinking Actively in a Social Context learning model influences the divergent thinking skills of elementary school students. The model provides evidence about the improvement of divergent thinking skills.

Keywords: Thinking Actively in a Social Context; Divergent Thinking Skill; Elementary School Students

1. Introduction

The development of the times from year to year brings more changes and progress in human life. One field that is experiencing changes is education. Education is a process of building the nation, developing human resource intelligence, and forming the nation's character/personality. According to Martinez [1], education has a role to build the nation by increasing students' understanding. The understanding that is being widely discussed in education is about the 4 thinking skills as pointed out by Chalkiadaki [2] that four thinking skills are in line with 21st-century education. These skills are critical, creative, communicative, and collaborative thinking skills. They have an equally important position.

However, the Indonesian government through the 2013 curriculum emphasizes the importance of creative thinking skills. Creativity also means divergent thinking. These two terms have the same meaning. Divergent thinking is spontaneous thinking with a free,

broad, and open way of thinking. Divergent thinking has the openness of everything that might happen and does not rule out the presence of unusual answers [3]. The students who have divergent thinking skills will be characterized by behaviors that are different from others. According to Joseph G. Mason [4], there are four main characteristics of a divergent-thinking person, namely problem sensitivity, the flow of ideas, originality, and flexibility.

Previous research found that students had a passive attitude when studying and did not want to ask questions or give answers when asked by the teacher [5]. Learning activities in schools are still centered on the teacher as a provider of information. The teacher does not provide activities that stimulate students to solve problems because he/she only focuses on the workbook. Also, the teacher chooses a learning model that is not following the material presented so that students have not been able to understand the material being studied properly. This makes students' thinking skills during the learning process does not develop well. This has an impact on the results of daily tests. Many students do not meet the Minimum Completeness Criteria (KKM) standards determined by the school and do not understand the material being studied well.

The Thinking Actively in a Social Context (TASC) model comes with a novelty to overcome these problems. The TASC model was first developed by Belle Wallace [6]. This learning concept is different from the common models. It is a model through which the thinking process can be used to maximize students' skills, both divergent and convergent thinking skills [7]. The TASC model emphasizes the problem-solving process on every knowledge possessed [8]. This model is carried out by doing a project, investigating a task, and proving an experiment [9]. TASC has four specific components with specific activities. Rosidi [10] explained that the TASC model has four important elements, namely the development of thinking skills, active participation, social collaboration, and context (based on student experience).

Researchers have extensively reviewed a variety of comparable studies. Many studies have shown that the TAS model is more effective than problem-solving-based methods [11]. The outcomes were a mixed bag. There are both favorable and unfavorable impacts. There are many research that look into divergent thinking abilities [12]. This competency is written in great detail because I'm curious about the overall profile.

This study's findings are nearly identical to the findings in general. It does, however, have a distinct side. For example, the researcher compares the TASC model to the DI model in the comparison model. As a comparative model, past studies have often used the conventional model. In fact, even conventional models have unusual names or aren't totally conventional without the use of other techniques or materials. From the description above, with the TASC learning model, students are expected to be able to improve their divergent thinking skills. Therefore, this study pupose to identify whether the TASC learning model influences divergent thinking skills.

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2. Method

2.1. Research design

This study is quantitative research with a quasi-experimental type using a non-equivalent group design. In this design, pretest was used before treatment for the experimental and the control group (O1, O3). Then, the results were used as the basis for determining changes. In addition, it can also minimize or reduce the bias of the selection. Giving post-test at the end of the activity could show how effective the treatment (X) is. It is to see the difference in scores before and after the treatment [13]. Two classes/groups, experimental and control groups, were used. The experimental group was treated with the TASC model while the control group was only treated with the direct instruction (DI) model.

2.2. Research sample

This study was arranged in the Laweyan District, Surakarta. The research population was all-fifth grade elementary school students in Laweyan District, Surakarta. Meanwhile, the research sample consisted of six classes, namely class VA at the Mangkubumen Lor Public Elementary School, class VA at Sondakan Public Elementary School, class V at Pajang III Public Elementary School, class VA at Bratan Public Elementary School Number 1, and class V at Jajar Public Elementary School, and class V at Tegalsari Public Elementary School. The six schools were divided into experimental and control groups. The number of students in the experimental and control groups was 178 students. The sampling technique was stratified random sampling. This type of sampling is a sampling method where the grouping of samples into strata is obtained through other random sampling methods.

2.3. Data collection technique

Data collection techniques are methods used to collect information or facts in the field [13]. The type of data used was quantitative data because it is a number that can be calculated/tested. Data were gathered by using test. The instruments used were a divergent thinking skill instrument and a document in the form of a lesson plan using the TASC and DI models.

2.4. Data validation technique

The test instrument was validated before being used to collect data. The validity technique used was product moment analysis with Microsoft excel. The calculation of the validity results is declared valid if the r_{value} is greater than or equal to the r_{table}. Of the 20 essay questions tested, 14 valid essay questions were obtained. The results are as follows.

Table 1. Classification of validation items

Category	No. items	No. valid item
Valid	14	2,3,5,7,8,9,10,11,12,13,14,16,17,19
Invalid	6	1,4,6,15,18,20

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Next, the reliability was calculated using Cronbach's alpha formula. Reliability test was conducted to determine the similarity of each valid question. The data is reliable if the value of r is greater than 0.7. The calculation results obtained a reliability value of 0.97. In addition to the calculation of validity and reliability, the researcher also calculated the discriminating power and level of difficulty to support the choice of instrument items. From the results of the calculation of the level of difficulty of the test instrument, there were 17 medium-level questions, 2 low-level questions, and 1 difficult-level question. The researchers also proceeded with the calculation of discriminating power. Differentiating data that can be used are instruments with an index greater than or equal to 0.30. From the test data, only 8 items had good discriminating power; the remaining 12 were declared as poor. The classification is as follows.

Table 2. Classification of discriminating power of items

Category	No. items	No. valid item
Good	12	1, 3, 4, 6, 8, 10, 11, 12, 14, 15, 18, 20
Poor	8	2, 5, 7, 9, 13, 16, 17, 19

The table above shows that only eight items (2, 5, 7, 9, 13, 16, 17, and 19) were used. They have met all the criteria of validity, reliability, level of difficulty, and discriminating power.

2.5. Data analysis

Quantitative data analysis is utilized to analyze data in the form of numbers by applying various statistical techniques [13]. Descriptive and inferential statistics are used in the analysis of this study. The data were analyzed using statistic test. The test was carried out using t-test with a significant level of 0.05. The t-test is used to see the results of testing the effect of the independent variable (influence) on the dependent variable (influenced). In addition, the researchers also conducted prerequisite tests before testing the hypothesis. The tests included normality and homogeneity tests. For the normality test, the Lilliefors test was used while the Bartlet test was used for the homogeneity test.

2.6. Result and Discussion

Based on the data before and after the treatment, the average results of the pre-test and post-test scores in each group were obtained. The results are as follows.

Table 3. Calculation of Test Score

Remark	Pre-test		Post-test	
	Experimental Group	Control group	Experimental Group	Control group
Maximum score	81	81	97	84
Minimum score	38	38	44	41
Mean	63	60	78	63
Median	66	59	78	63

There are differences in the post-test answers of students in the experimental and the control group. The experimental group obtained an average score of 78 while the control group obtained an average score of 63. To complete the hypothesis testing, several tests

were carried out, including (1) normality test using Lilliefors test and (2) homogeneity test using Bartlett test.

Based on the normality test, the value of L is lower than that of the L-table. This means that the sample is normally distributed with the following calculation results:

Table 4. Results of normality test calculation

Group	L	L-table	Criteria	Remark
Experimental	0.0680	0.939	L < L-table	The data is normally distributed.
Control	0.0874			

From the calculation results in Table 4, it can be summarized that based on the normality test of the post-test results, the value of L is lower than that of the L-table, so the two samples are normally distributed. Next, in the homogeneity test, the Bartlett test formula was used. Obtaining homogeneous test results displayed on the table below:

Table 5. Results of homogeneity test calculation

Group	X^2	X^2-table	Criteria	Remark
Experimental	3.771	5.991	$X^2 < X^2$-table	The data is homogeneous.
Control	3.771			

Seen from Table 5, the value of X^2 is lower than that of the X^2 table. It can be concluded from the two classes are homogeneous. Hypothesis testing was used to determine the effect of using the TASC learning model on the divergent thinking skills of the fifth-grade students at elementary schools in Laweyan, Surakarta. The t-test formula for the analysis of the hypothesis testing results. The results of the t-test calculation can be seen in the table below.

Table 6. The results of hypothesis test calculation

Group	Mean	DK	T	T-table	Remark
Experimental	78	176	9.07	1.97	The effect is significant
Control	63				

Based on the calculation of hypothesis testing with t-test at a significant level = 0.05 and CA = 176, t (9.07) > t-table (1.97), so the average value of post-test of students' divergent thinking skills in the experimental group was higher than that in the control group. Thus, H_1 is accepted or H_0 is rejected, which means that there is a significant effect of using the TASC learning model on the divergent thinking skills of the fifth-grade students at the elementary schools in Laweyan, Surakarta.

Based on the results of previous research conducted by Wallace et al. [6], TASC helps students to be more confident in discussion activities. It is supported by Wardhani [14] that the TASC model has succeeded in increasing higher-order thinking skills. This success is in line with Lakey's theory [15] that the TASC model is a model that provides opportunities for students to learn a lot, interact, and experiment. These opportunities are a way for students to get to know more deeply and understand more concepts/materials that they have not received in class. The use of learning models does lead to the success of students. Learning model is also a tool for teachers to deliver teaching materials. This is as stated by Mutaqy, Nasution, & Purnomo [16] that learning model affects problem-

solving skills. From these skills, students will have two ways of thinking at once, namely divergent and convergent thinking.

Looking further from some of the previous findings and the theory of the TASC model, there is a gap with students who study with the DI model. The low results found have a quite logical reason. The DI model is known as a conventional model that emphasizes student-centered learning. This is following the theory of Mukadam, Vyas, & Nayak [17] that the DI model is limited by rigid teacher directions. It is also dominated by teachers who talk a lot in front of the class so that students are not encouraged to develop their creativity [18], [19]. The intensity and duration of the teacher's lectures were also found during the learning process so that it seemed like a waste of time to explore the potential of students. The finding of the low learning outcomes of students who study with the DI model was also revealed by Wenno [20] in his research. He revealed that the DI model did not significantly affect the cognitive development and learning experience of students. It provides more verbal instruction and repetitive practice. According to Mokhtar [21], this model is not enough to help increase student motivation because they think the learning system is very boring.

From the above review, the TASC learning model inevitably has a more significant effect than the DI model on divergent thinking skills. This finding has been supported by several previous studies with similar findings that the TASC model was able to improve students' creative thinking skills [22], [23]. The success of the TASC model as a shortcut for teachers to use it in classes was also due to the theory written by past scholars. Finally, students have more possibilities and a broader understanding of valuable learning experiences. With some data backing it up, it's safe to state that the TASC model is successfully used as a learning approach in elementary schools.

3. Conclusion

This study concludes that the TASC learning model has a significant effect on the divergent thinking skills of elementary school students. These findings can be used as reading material for teachers and pre-service teachers who are considering an innovative model that can improve the divergent thinking skills of elementary school students. This study is limited to the elementary school level and does not integrate media or other learning tools. Therefore, it is recommended that the next researcher test the effectiveness of the TASC learning model integrated with other learning media/realia as a way of adding scientific theory from education.

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References

[1] H. C. Pulido-Martínez, “Analysing the artefacts to produce an education of quality: from the disciple to the customer in a Colombian university,” *Subjectivity*, vol.

12, no. 2, pp. 1–10, 2019, doi: 10.1057/s41286-019-00081-w.

[2] A. Chalkiadaki, "A systematic literature review of 21 st century skills and competencies inpPrimary education," *Int. J. Instr.*, vol. 11, no. 3, pp. 1–16, 2018, doi: 10.12973/iji.2018.1131a.

[3] S. A. Chermahini and B. Hommel, "Creative mood swings: Divergent and convergent thinking affect mood in opposite ways," *Psychol. Res.*, vol. 76, no. 5, pp. 634–640, 2012, doi: 10.1007/s00426-011-0358-z.

[4] J. G. Mason, *How to be a more creative executive*. New York: Mc.Graw Hill Book, 1960.

[5] S. F. Meilana, N. Aulia, Z. Zulherman, and G. B. Aji, "Pengaruh Model Pembelajaran Think Pair Share (TPS) terhadap Kemampuan Berpikir Kritis di Sekolah Dasar," *J. Basicedu*, vol. 5, no. 1, pp. 218–226, 2020, doi: 10.31004/basicedu.v5i1.644.

[6] B. Wallace, A. Bernardelli, C. Molyneux, and C. Farrell, "TASC: Thinking Actively in a Social Context. A universal problem-solving process: A powerful tool to promote differentiated learning experiences," *Gift. Educ. Int.*, vol. 28, no. 1, pp. 58–83, 2012, doi: 10.1177/0261429411427645.

[7] H. West, "A Study of the Impact of Using the TASC Wheel on Children's Involvement in their Own Learning," *Gift. Educ. Int.*, vol. 24, no. 2–3, pp. 297–304, 2008, doi: 10.1177/026142940802400322.

[8] C. J. Maker and R. Zimmerman, "Problem solving in a complex WOrld: integrating DISCOVER, TASC, and PBL in a teacher education project," *Gift. Educ. Intemational*, vol. 24, no. 1, pp. 160–178, 2015.

[9] P. Leyland, "Thinking Actively in a Social Context," *Gift. Educ. Int.*, vol. 25, no. 3, pp. 301–305, 2009, doi: 10.1177/026142940902500312.

[10] I. Rosidi, "Uji Kelayakan Perangkat Pembelajaran Pengelolaan Limbah dengan Pendekatan TASC (Thinking Actively In a Social Context)," *SEJ (Science Educ. Journal)*, vol. 1, no. 1, p. 7, 2017, doi: 10.21070/sej.v1i1.831.

[11] M. Fauziah, S. Marmoah, T. Murwaningsih, and K. Saddhono, "The effect of thinking actively in a social context and creative problem-solving learning models on divergent-thinking skills viewed from adversity quotient," *Eur. J. Educ. Res.*, vol. 9, no. 2, pp. 537–568, 2020, doi: 10.12973/eu-jer.9.2.537.

[12] D. K. Hassan, "Divergent thinking techniques discrepancy and functional creativity: Comparative study of structural and procedural techniques in architectural design," *Ain Shams Eng. J.*, vol. 9, no. 4, pp. 1465–1479, 2018, doi: 10.1016/j.asej.2016.10.002.

[13] J. W. Creswell, "Research Design Qualitative, Quantitative, and Mixed Method Approaches." Sage Publication, New York, p. 273, 2013.

[14] I. Y. Wardhani, "Pembelajaran Thinking Actively In Social Context Untuk Meningkatkan Kemampuan Higher Order Thinking Siswa SMA," *J. Biol. Educ.*, vol. 1, no. 1, p. 1, 2018, doi: 10.21043/jobe.v1i1.3532.

[15] J. Lakey and A. Einstein, "Purposeful, creative problem solving," *Gift. Educ. Int.*, vol. 25, no. 1, pp. 60–70, 2009.

[16] R. M. Mutaqy, Nasution, and N. H. Purnomo, "Effects of TASC Learning Model (Thinking Actively In A Social Context) on Ability Problem-solving in Natural Resource Management Materials," *Indones. J. Soc. Stud.*, vol. 2, no. 1, pp. 11–20, 2019, [Online]. Available: https://journal.unesa.ac.id/index.php/jpips/index%0AEffects.

[17] P. Mukadam, S. Vyas, and H. Nayak, "Skinner's Programmed Learning vs. Conventional Teaching Method In Medical Education: A Comparative Study," *Natl. J. Community Med.*, vol. 5, no. 1, p. 144, 2014, [Online]. Available: https://doaj.org/article/634e765927b04a7a9de2a504c677022e.

[18] M. F. Ayaz and H. Şekerci, "The effects of the constructivist learning approach on student's academic achievement: A meta-analysis study," *Turkish Online J. Educ. Technol.*, vol. 14, no. 4, pp. 144–156, 2015.

[19] A. Buchori, P. Setyosari, I. W. Dasna, S. Ulfa, I. N. S. Degeng, and C. Sa'dijah, "Effectiveness of Direct Instruction Learning Strategy Assisted by Mobile Augmented Reality and Achievement Motivation on Students Cognitive Learning Results," *Asian Soc. Sci.*, vol. 13, no. 9, p. 137, 2017, doi: 10.5539/ass.v13n9p137.

[20] H. Wenno, "Direct Instruction Model to Increase Physical Science Competence of Students as One Form of Classroom Assesment," *Int. J. Eval. Res. Educ.*, vol. 3, no. 3, pp. 1–6, 2014, doi: 10.11591/ijere.v3i3.6492.

[21] F. A. Mokhtar, "Rethinking Conventional Teaching In Language Learning And Proposing Edmodo As Intervention A Qualitative Analysis," *Malaysian Online J. Educ. Technol.*, vol. 4, no. 2, pp. 22–37, 2016.

[22] S. Cartwright, "A Pilot Project of 8 lessons across Social Studies: Thinking Actively in a Social Context: (TASC)," *Gift. Educ. Int.*, vol. 24, no. 2–3, pp. 315–322, 2008, doi: 10.1177/026142940802400324.

[23] H.-M. Davies, "An overview of an investigation into the Effects of using TASC Strategies in the Development of Children's Thinking and Problem-solving Skills in Science," *Gift. Educ. Int.*, vol. 24, no. 2–3, pp. 305–314, 2008, doi: 10.1177/026142940802400323.